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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/637,199	08/08/2003	Rongchung Tyan	LMP128US	4100

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EXAMINER
LEPISTO, RYAN A

ART UNIT	PAPER NUMBER
2883	

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Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/637,199	TYAN ET AL.	
	Examiner	Art Unit	
	Ryan Lepisto	2883	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *22 June 2006*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-41 and 53-63* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-41 and 53-63* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *08 August 2003 and 11 October 2005* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Claim Rejections - 35 USC § 103

1. **Claim 1-7, 9-11, 13-14, 16-17, 20-21, 33-41 and 53-60** are rejected under 35 U.S.C. 103(a) as being unpatentable over **Kunikane et al (US 5,479,547)** (Kunikane) in view of the prior art figures 15-17 of the Kunikane reference.

Kunikane teaches a bi-directional planar light circuit (PLC) transceiver device for separating optical signals at two separate wavelengths from one another (Figs. 1-3) comprising a silicon glass PLC (21) with internal waveguides (23) for directing optical signals, a wavelength selective filter (WSF) (26) positioned on an external side of the PLC and perpendicular to the waveguide (23) (Fig. 1) and is configured to pass a first wavelength and to reflect a second wavelength (column 4 lines 51-53) formed by evaporation deposition (column 7 lines 63-64), a photo-detector (25) positioned on the opposite side of the PLC from the WSF (26) but still in energy-coupled proximity since the package is small, a laser diode (24) positioned on the same side as the photo-detector (25) (note that the figures show the photo-detector and diode apart from the PLC but it is disclosed that these components are disposed on the end of the PLC, column 4 lines 44-47) wherein the waveguides structure (23) is a branching structure and has an input end (WSF end) and an output end (diode and detector end) with the WSF in proximal relationship to both ends since the package is small and the input end functioning as an input and output since it is bi-directional (column 5 lines 3-19). The device functions by inputting a first wavelength (which is bi-directional, see arrows in Fig. 1) via fiber (27) in a V-groove substrate (column 8 lines 3-11) to the WSF (26) on

the input side that reflects or transmits the signal to the detector (25) and a laser diode (24) transmits another signal at the output side.

Kunikane does not show expressly the input fiber (27) inputting a signal having two distinct wavelengths.

Kunikane's prior art figures 15-17 teach an optical subscriber system having a transmitter/receiver unit (5) shown in greater detail in Fig. 17. Fig. 16 shows that the input fiber (11) inputs optical signals at two distinct wavelengths (λ_1, λ_2) (column 1 lines 44-51) even though the detailed view of Fig. 17 only shows the input fiber (11) inputting one wavelength. The purpose of the unit (5) and of Kunikane's invention (of Fig. 1 and 3) is to be able to input the multiple signals. Kunikane's invention is just another way to implement the unit (5) of the prior art to minimize size (column 2 lines 18-19). The invention of Kunikane (Figs. 1, 3) still follows the overall prior art implementation shown in Fig. 16 and therefore will have a single input source (fiber 27 of Fig. 1) transmitting two wavelengths.

Kunikane and Kunikane's stated prior art are analogous art because they are from the same field of endeavor and similar problem solving area, optical multiplexer module with filter film.

At the time of the invention, it would have been obvious to a person of ordinary skill in the art to infer from Kunikane's invention and stated prior art that the input fiber (27) will indeed input two wavelengths as evidenced by the prior art unit view of Fig. 16 showing two inputted wavelengths while the detailed view of Fig. 17 only shows one, which is consistent to Kunikane's teaching in Figs. 1 and 3.

The motivation for doing so would have been reduce cost and complexity of subscriber systems by being able to provide low-speed and high-speed communications services in a single module (column 1 lines 24-30).

2. **Claim 15** is rejected under 35 U.S.C. 103(a) as being unpatentable over Kunikane as applied to claims 1-7, 9-11, 13-14, 16-17, 20-21, 33-41 and 53-60 above, and further in view of **Kuhara et al (US 2003/0210866 A1)** (Kuhara).

Kunikane teaches the device described above.

Kunikane does not teach expressly using an LED as the source.

Kuhara teaches a transceiver that emits a 1.31 μm wavelength that can be from either a laser diode or LED (paragraph 0059).

Kunikane and Kuhara are analogous art because they are from the same field of endeavor, transceivers with branched waveguides, detectors and sources transmitting a 1.31 μm wavelength signal among others.

At the time of the invention, it would have been obvious to a person of ordinary skill in the art to use the teaching of Kuhara that either a laser diode or LED can transmit the wavelength specified by Kunikane (column 4 line 52).

The motivation for doing so would have been to reduce cost by being able to specify the least expensive of either a laser diode or LED for the device.

3. **Claim 18** is rejected under 35 U.S.C. 103(a) as being unpatentable over Kunikane as applied to claims 1-7, 9-11, 13-14, 16-17, 20-21, 33-41 and 53-60 above, and further in view of **Fouquet (US 6,195,478 B1)**.

Kunikane teaches the device described above.

Kunikane does not teach expressly the waveguides being tapered.

Fouquet teaches a PLC having internal waveguides that couple between filters and optical fibers wherein the internal waveguides are tapered (column 9 lines 24-32).

Kunikane and Fouquet are analogous art because they are from the same field of endeavor, transceivers with branched waveguides and sources transmitting to filters.

At the time of the invention, it would have been obvious to a person of ordinary skill in the art to use the teaching of Fouquet that internal PLC waveguides can be tapered in the device taught by Kunikane.

The motivation for doing so would have been to increase coupling efficiency by having a wide end at the filter for good coupling and a narrower end at the fibers to direct the signal to the fiber without much loss (Fouquet, column 9 lines 28-32).

4. **Claims 61 and 63** are rejected under 35 U.S.C. 103(a) as being unpatentable over Kunikane as applied to claims 1-7, 9-11, 13-14, 16-17, 20-21, 33-41 and 53-60 above, and further in view of **Scobey (US 5,583,683)**.

Kunikane teaches the device described above.

Kunikane does not expressly state that the filter is variable thickness or an interference filter.

Scobey teaches a transceiver using a planar block waveguide with a filter (74) disposed on an end of the block wherein the filter is a variable thickness interference filter that allows one wavelength band through and reflects others (column 6 lines 1-16).

Kunikane and Scobey are analogous art because they are from the same field of endeavor, transceivers with sources and filters for multiplexing.

At the time of the invention, it would have been obvious to a person of ordinary skill in the art to use the teaching of Scobey that filters that transmit one wavelength and reflect others is often called an interference filter and that they are know in the art to often be variable thickness.

The motivation for doing so would have to increase efficiency and temperature characteristics by using a filter that demonstrates excellent thermal stability and narrow bandwidths (Scobey, column 6 lines 4-6).

5. **Claim 62** is rejected under 35 U.S.C. 103(a) as being unpatentable over Kunikane as applied to claims 1-7, 9-11, 13-14, 16-17, 20-21, 33-41 and 53-60 above, and further in view of **Grasis et al (US 6,198,857 B1)** (Grasis).

Kunikane teaches the device described above.

Kunikane does not expressly state that the filter is a dichroic filter.

Grasis teaches a transceiver using a planar block waveguide with a filter (60) disposed on an end of the block wherein the filter can be a dichroic filter (column 11 lines 11-15).

Kunikane and Grasis are analogous art because they are from the same field of endeavor, transceivers with sources and filters for multiplexing.

At the time of the invention, it would have been obvious to a person of ordinary skill in the art to use the teaching of Grasis that dichroic filters can be used in multiplexing structure like the one taught by Kunikane.

The motivation for doing so would have to increase efficiency by using a filter with improved filter performance to provide better multiplexing (Grasis, column 11 lines 13-15).

6. **Claims 8, 12 and 19** are rejected under 35 U.S.C. 103(a) as being unpatentable over Kunikane as applied to claims 1-7, 9-11, 13-14, 16-17, 20-21, 33-41 and 53-60 above, and further in view of **Hashimoto et al (US 6,480,639 B2)** (Hashimoto).

Kunikane teaches the device described above.

Kunikane does not expressly state that silicon substrate has intrinsic wavelength selection absorption properties.

Hashimoto teaches that silicon has an intrinsic property of an absorption coefficient that rapidly increases with increasing conductive carrier density (column 14 lines 36-39) meaning that stray light from the module would be repressed (absorbed) by the substrate at what ever wavelength it is (at the same time still transmitting some, since silicon won't fully absorb the signal) (column 14 lines 52-53).

Kunikane and Hashimoto are analogous art because they are from the same field of endeavor, transceivers with sources and filters on silicon substrates.

At the time of the invention, it would have been obvious to a person of ordinary skill in the art to use the teaching of Hashimoto that silicon has in intrinsic absorption property that would be true for the silicon substrate taught by Kunikane also.

The motivation for doing so would have to increase efficiency and reduce interference by using a material that can efficiently reduce stray light leakage (Hashimoto, column 14 lines 54-56).

7. **Claims 22, 24-27 and 29-32** are rejected under 35 U.S.C. 103(a) as being unpatentable over Kunikane as applied to claims 1-7, 9-11, 13-14, 16-17, 20-21, 33-41 and 53-60 above, and further in view of **Rolston et al (US 2005/0018993)** (Rolston).

Kunikane teaches the device described above.

Kunikane does not expressly state that the V-groove substrate is cut at a forty-five degree angle making an input ferrule structure made of a material that is near infrared transparent.

Rolston teaches an optical ferrule (Figs. 5A, 6A, 7A, 8A) comprising a V-groove cut substrate (20) made of silicon (paragraph 0059) which is a material that is near infrared transparent (see Nakanishi et al (US 2003/0123819 A1) paragraph 0022) that holds optical fibers (6) with an optically transparent adhesive (18) wherein the substrate has a polished end face cut at a forty-five degree angle (paragraph 0055) for coupling lasers to detectors arrays (paragraphs 0053, 0090).

Kunikane and Rolston are analogous art because they are from the same field of endeavor, coupling sources to detectors via silicon V-groove substrates.

At the time of the invention, it would have been obvious to a person of ordinary skill in the art to use the ferrule structure as taught by Rolston wit the forty-five degree cut to reduce back reflections that is widely known and used in the art for the input structure in Kunikane.

The motivation for doing so would have to reduce back reflections into the fibers by cutting the fibers and substrate at a forty-five degree angle

8. **Claims 23-24 and 28** are rejected under 35 U.S.C. 103(a) as being unpatentable over Kunikane in view of Rolston as applied to claims 1-7, 9-11, 13-14, 16-17, 20-22, 24-27, 29-32, 33-41 and 53-60 above, and further in view of **Di Domenico, Jr. et al (4,165,496)** (Di Domenico).

Kunikane in view of Rolston teaches the device described above.

Kunikane in view of Rolston does not expressly state the cover of the substrate is glass or that a photo-detector is located on the surface of the ferrule.

Di Domenico teaches (Fig. 6) a V-groove substrate (40) holding a fiber (42) with a glass cover plate (44) and adhesive holding the fiber down with a photo-detector (45) adhered to the cover plate (44) (column 5 lines 31-58).

Kunikane in view of Rolston and Di Domenico are analogous art because they are from the same field of endeavor coupling sources to detectors via V-groove substrates.

At the time of the invention, it would have been obvious to a person of ordinary skill in the art to use the teaching of Di Domenico in the structure taught by Kunikane in

view of Rolston since they are both coupling a source to a detector via a fiber held in a V-groove substrate.

The motivation for doing so would have to increase coupling efficiency by using a configuration that minimizes fiber movement relative to the source and is suitable for use in an optical communications system (Di Domenico, column 2 lines 58-60).

Response to Arguments

9. Applicant's arguments with respect to rejected claims have been considered but are moot in view of the new ground(s) of rejection.

Contact Information

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Ryan Lepisto whose telephone number is (571) 272-1946. The examiner can normally be reached on M-Th 7:30 AM - 5:30 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Frank Font can be reached on (571) 272-2415. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

Ryan Lepisto

Art Unit 2883

Date: 7/24/06

Frank Font

Supervisory Patent Examiner

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